

Written Amendment
(Amendment based on Section 11)

To Director-General of the Japanese Patent Office

1. Identification of the International Application
PCT/JP2004/000463

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4. Object of Amendment: Claims

5. Contents of Amendment

(1) As shown in a separate sheet, we amend Claim 1 on page 17 (translation: page 21) by inserting "the binder comprises an aqueous resin and a rubber-based resin," after "A negative electrode for lithium secondary batteries, comprising a negative active material and a binder, wherein".

(2) As shown in a separate sheet, we amend Claim 6 on page 18 (translation: page 22).

(3) As shown in a separate sheet, we amend Claim 7 on page 18 (translation: page 22) by inserting "comprising an aqueous resin and a rubber-based resin" after "in the presence of a binder"

(4) As shown in a separate sheet, we cancel Claim 12 on page 19 (translation: page 23).

(5) As shown in a separate sheet, we amend Claim 13 on page 19 (translation: pages 23 to 24) by inserting "the binder comprises an aqueous

resin and a rubber-based resin,” after “the negative electrode comprises a negative active material and a binder.”

(6) As shown in a separate sheet, we amend Claim 18 on page 20 (translation: page 25).

(7) As shown in a separate sheet, we add Claim 19 on page 20 (translation: page 25).

6. List of appended documents

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| (1) New page 17 (translation: pages 21 to 22) and
New page 17/1 (translation: page 22), Claims | one each |
| (2) New page 18 (translation: pages 22 to 23), Claims | one |
| (3) New page 19 (translation: pages 23 to 25), Claims | one |
| (4) New page 20 (translation: pages 24 to 25), Claims | one |

CLAIMS

1. (Amended) A negative electrode for lithium secondary batteries,
comprising a negative active material and a binder,
5 wherein the binder comprises an aqueous resin and a rubber-based
resin,
the negative active material comprises graphite A and graphite B,
shapes of primary particles of the graphite A are spherical or elliptical,
an average particle diameter of the primary particles of the graphite A
10 ranges between 10 μm and 30 μm inclusive,
sizes of crystallites of the graphite A in a direction of a c-axis are smaller
than 100 nm and tap density of the graphite A is 1.0 g/cm^3 or higher,
shapes of primary particles of the graphite B are flat,
an average particle diameter of the primary particles of the graphite B
15 ranges between 1 μm and 10 μm inclusive, and
sizes of crystallites of the graphite B in a direction of a c-axis are 100
nm or larger.
2. The negative electrode for lithium secondary batteries according to
20 Claim 1, wherein at least a part of surfaces of the graphite A is further
covered with non-graphite carbon.
3. The negative electrode for lithium secondary batteries according to
Claim 1,
25 wherein, I_{1350} denotes Raman intensity at approximately 1350cm^{-1} ,
 I_{1580} denotes Raman intensity at approximately 1580cm^{-1} and a R-value of
Raman spectrum is obtained by a formula: $R=(I_{1350}/I_{1580})$,
a R-value of Raman spectrum of the graphite A is 0.4 or larger when
the graphite A is excited by an Ar laser with a wavelength of 5145 Å.

4. The negative electrode for lithium secondary batteries according to Claim 1, wherein the primary particles of the graphite B aggregate or bond so as to form secondary particles, and an average particle diameter of the secondary particles ranges between 10 μm and 30 μm inclusive.

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5. The negative electrode for lithium secondary batteries according to Claim 1, wherein a weight proportion of the graphite A ranges between 10 wt% and 90 wt% inclusive, with respect to a sum weight of the graphite A and the graphite B.

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6. (Amended) The negative electrode for lithium secondary batteries according to Claim 1, wherein paint-film density of the negative electrode for lithium secondary batteries is 1.5 g/cm³ or higher.

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7. (Amended) A method for manufacturing a negative electrode for lithium secondary batteries comprising the steps of:

preparing graphite A of which shapes of primary particles are spherical or elliptical, an average particle diameter of the primary particles ranges between 10 μm and 30 μm inclusive, sizes of crystallites in a direction of a c-axis are smaller than 100 nm, and tap density is 1.0 g/cm³ or higher;

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preparing graphite B of which shapes of primary particles are flat, an average particle diameter of the primary particles ranges between 1 μm and 10 μm inclusive, and sizes of crystallites in a direction of a c-axis are 100 nm or larger;

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preparing paint by mixing the graphite A and the graphite B in the presence of a binder comprising an aqueous resin and a rubber-based resin, and a solvent; and

applying the paint on a collector, drying the paint and then performing a pressure forming treatment.

30

8. The method for manufacturing the negative electrode for lithium secondary batteries according to Claim 7, wherein at least a part of surfaces of the graphite A is further covered with non-graphite carbon.

5 9. The method for manufacturing the negative electrode for lithium secondary batteries according to Claim 7,

wherein, I_{1350} denotes Raman intensity at approximately 1350cm^{-1} , I_{1580} denotes Raman intensity at approximately 1580cm^{-1} and a R-value of Raman spectrum is obtained by a formula: $R=(I_{1350}/I_{1580})$,

10 a R-value of Raman spectrum of the graphite A is 0.4 or larger when the graphite A is excited by an Ar laser with a wavelength of 5145 \AA .

10. The method for manufacturing the negative electrode for lithium secondary batteries according to Claim 7, wherein the primary particles of
15 the graphite B aggregate or bond so as to form secondary particles, and an average particle diameter of the secondary particles ranges between $10\text{ }\mu\text{m}$ and $30\text{ }\mu\text{m}$ inclusive.

11. The method for manufacturing the negative electrode for lithium
20 secondary batteries according to Claim 7, wherein a weight proportion of the graphite A ranges between 10 wt% and 90 wt% inclusive, with respect to a sum weight of the graphite A and the graphite B.

12. (Cancelled)

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13. (Amended) A lithium secondary battery, comprising a positive electrode, a negative electrode and nonaqueous electrolyte,

wherein the negative electrode comprises a negative active material and a binder,

30 the binder comprises an aqueous resin and a rubber-based resin,

the negative active material comprises graphite A and graphite B,
 shapes of primary particles of the graphite A are spherical or
 elliptical,

an average particle diameter of the primary particles of the graphite
 5 A ranges between 10 μm and 30 μm inclusive,

sizes of crystallites of the graphite A in a direction of a c-axis are
 smaller than 100 nm and tap density of the graphite A is 1.0 g/cm³ or higher,
 shapes of primary particles of the graphite B are flat,

an average particle diameter of the primary particles of the graphite
 10 B ranges between 1 μm and 10 μm inclusive, and
 sizes of crystallites of the graphite B in a direction of a c-axis are 100
 nm or larger.

14. The lithium secondary battery according to Claim 13, wherein at least
 15 a part of surfaces of the graphite A is further covered with non-graphite
 carbon.

15. The lithium secondary battery according to Claim 13,
 wherein, I_{1350} denotes Raman intensity at approximately 1350cm⁻¹,
 20 I_{1580} denotes Raman intensity at approximately 1580cm⁻¹ and a R-value of
 Raman spectrum is obtained by a formula: $R=(I_{1350}/I_{1580})$,

a R-value of Raman spectrum of the graphite A is 0.4 or larger when
 the graphite A is excited by an Ar laser with a wavelength of 5145 Å.

25 16. The lithium secondary battery according to Claim 13, wherein the
 primary particles of the graphite B aggregate or bond so as to form secondary
 particles, and an average particle diameter of the secondary particles ranges
 between 10 μm and 30 μm inclusive.

30 17. The lithium secondary battery according to Claim 13, wherein a

weight proportion of the graphite A ranges between 10 wt% and 90 wt% inclusive, with respect to a sum weight of the graphite A and the graphite B.

18. (Amended) The lithium secondary battery according to Claim 13,
5 wherein paint-film density of the negative electrode is 1.5 g/cm³ or higher.

19. (Added) The lithium secondary battery according to Claim 13,
wherein the nonaqueous electrolyte comprises vinylene carbonate.